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AGRICULTURAL MEMORANDUM NO 595

VARIATION OF SURFACE WIND SPEED WITH STATION HEIGHT ABOVE MEAN SEA LEVEL - SOUTH AND SOUTH WEST ENGLAND

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Agricultural Memorandum No 594 examined the surface wind increase with height over central and northern England.

In south and southwest England proximity to the coast has as much effect on wind speed as height and in this case the distances from the coast in a northwesterly and southwesterly direction were used as additional parameters in a multiple regression analysis.

Station	Height AMSL	D_N	D_S	W	Estimate
Larkhill	145 m	200 km	85 km	9.0 kt	9.9 kt
Boscombe Down	130	220	80	10.2	9.7
Porton	120	220	85	10.1	9.4
Plymouth	64	55	0	10.3	10.8
Chivenor	22	5	40	9.7	9.5
St Mawgan	120	5	20	11.6	11.4
Abingdon	90	260	140	7.3	7.7

Where:

D_N = distance from coast towards northwest.

D_S = " " " " southwest.

W = average (1969-71) of mean hourly wind speed.

The regression is:

$$W = 9.97 + 0.0158H - 0.003D_N - 0.021D_S.$$

where H = station height AMSL in metres.

The multiple correlation coefficient is 0.90 and partial correlations of W on H, D_N and D_S are respectively 0.67, 0.24 and 0.60.

Conclusion. The increase of wind speed with station height AMSL of about $1\frac{1}{2}$ kt per 100 m, when the effect of geographical position is removed, compares well with the relationship found in central and northern England and described in Agr Memo No 594.

Any comments or suggestions on this paper should be referred to the author.

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